

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE (REV 11-2000)		ATTORNEY'S DOCKET NUMBER <b>70869-0072</b>	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>09/857142</b>	
INTERNATIONAL APPLICATION NO. <b>PCT/US00/26243</b>	INTERNATIONAL FILING DATE <b>06 October 2000 (06.10.00)</b>	PRIORITY DATE CLAIMED <b>08 October 1999 (08.10.99)</b>	
TITLE OF INVENTION <b>APPARATUS FOR HOLDING AND OPERATING ONE OR MORE SYRINGES</b>			
APPLICANT(S) FOR DO/EO/US <b>Wesley H. VERKAART</b>			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.</li> <li>4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).</li> <li>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).</li> <li>11. <input type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409).</li> <li>12. <input type="checkbox"/> A copy of the International Search Report (PCT/ISA/210).</li> </ol>			
<b>Items 13 to 20 below concern document(s) or information included:</b> <ol style="list-style-type: none"> <li>13. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>14. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>15. <input type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li>16. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>17. <input type="checkbox"/> A substitute specification.</li> <li>18. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</li> <li>20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li>21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li>22. <input type="checkbox"/> Certificate of Mailing by Express Mail</li> <li>23. <input type="checkbox"/> Other items or information:</li> </ol>			

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>09/857142</b>	INTERNATIONAL APPLICATION NO. <b>PCT/US00/26243</b>	ATTORNEY'S DOCKET NUMBER <b>70869-0072</b>
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24. The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5) :**

<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO .....	\$1000.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO .....	\$860.00
<input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....	\$710.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) .....	\$690.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....	\$100.00

**CALCULATIONS PTO USE ONLY**

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**\$710.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than  20  30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

**\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	12 - 20 =	0	x \$18.00	<b>\$0.00</b>
Independent claims	2 - 3 =	0	x \$80.00	<b>\$0.00</b>

Multiple Dependent Claims (check if applicable).	<input type="checkbox"/>	<b>\$0.00</b>
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**TOTAL OF ABOVE CALCULATIONS =** **\$710.00**

<input type="checkbox"/> Applicant claims small entity status. (See 37 CFR 1.27). The fees indicated above are reduced by 1/2.	<b>\$0.00</b>
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**SUBTOTAL =** **\$710.00**

Processing fee of <b>\$130.00</b> for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).	<input type="checkbox"/>	<b>\$0.00</b>
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**TOTAL NATIONAL FEE =** **\$710.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).	<input type="checkbox"/>	<b>\$0.00</b>
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**TOTAL FEES ENCLOSED =** **\$710.00**

<input type="checkbox"/> Amount to be: refunded	\$
<input type="checkbox"/> charged	\$

- A check in the amount of \_\_\_\_\_ to cover the above fees is enclosed.
- Please charge my Deposit Account No. **50-1088** in the amount of **\$710.00** to cover the above fees. A duplicate copy of this sheet is enclosed.
- The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **50-1088** A duplicate copy of this sheet is enclosed.
- Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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Clark & Brody  
1750 K Street, NW, Suite 600  
Washington, DC 20006

Telephone: 202-835-1111  
Facsimile: 202-835-1755

  
\_\_\_\_\_  
SIGNATURE

Conrad J. Clark  
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NAME

30,340  
\_\_\_\_\_  
REGISTRATION NUMBER

June 1, 2001  
\_\_\_\_\_  
DATE

APPARATUS FOR HOLDING AND OPERATING ONE OR MORE SYRINGES

TECHNICAL FIELD

This invention relates to syringes. In particular, the invention relates to a device for holding one or more syringes to facilitate operation of a single syringe or to operate and combine the fluids from a plurality of syringes.

BACKGROUND ART

The operation of a syringe is well known. In a common use, a hypodermic needle is attached to the barrel of a syringe for injecting a fluid into a patient. Syringes also have other uses, such as the application of a fluid to an exterior surface or the injection of a fluid into a conduit.

It is also known to combine the fluids from two separate syringes for application of the mixture to an object. An example of this is the combination of a first fluid containing fibrinogen in a first syringe and a second fluid containing thrombin in a second syringe to provide a fibrin sealant. This type of syringe typically provides a combining tip having two inlets, each of which receives the outlet of a respective one of two syringes. The combining tip provides a Y-type channel for combining the two fluids.

A problem in this art is how to facilitate handling the syringes and, in particular, how to handle two or more syringes such that they can be operated simultaneously with ease. In this regard, it is often desirable to link the syringe barrels and the syringe plungers to allow the operator to apply the contents in a controlled manner with one hand.

It may also be desirable to provide for operation of a single syringe by using the thumb to obtain more leverage on the end of the plunger.

A further requirement of devices in this art is that the components be inexpensive, easily sterilized, and disposable.

#### SUMMARY OF THE INVENTION

In accordance with the invention, a one-piece molded plastic handle receives the barrel of a first syringe for securely holding it in a position whereby the user may grip the handle and operate the plunger with the thumb. A clip is also provided for connecting the plunger of a syringe placed in the handle to the plunger of one or more additional syringes.

In use, the outlet ends of the syringes are attached to any of several applicator tips that are commercially available for combining fluids from two or more syringes. Thus, the luer lock tips at the outlet ends of the syringes are secured to the applicator tip while the plungers at the opposite ends are secured to the clip provided by the invention to result in a rigid assembly, with the syringe barrels essentially parallel.

One of the syringes is held in the handle so that the operator can operate the syringes simultaneously with the thumb by grasping the handle and pushing on the clip with the thumb.

The syringes may be of the same size, which would provide a 1:1 mixture ratio of the fluids. Or, the syringes may be of different sizes to provide another desired mixing ratio. For example, if the first syringe has a 10ml capacity, and a second syringe has a 1ml capacity, the mixing ratio will be 10:1. Syringes of different sizes are easily accommodated because the handle holds only a single syringe, and the remaining

syringes are held to the first by the applicator and the clip. By this construction, different sizes of syringes can be accommodated with a single handle by using a clip specifically designed to engage the plungers of the syringes. The preferred handle includes a cradle sized to receive the barrel of a 10ml syringe. The cradle is open at the top so the barrel can be snapped into the handle from the top or slid in from either end. The cradle can be a cylinder, which may require an adaptor for receiving barrels of different sizes.

The handle also preferably provides a storage bay for one or more clips, which may be of different sizes or may be redundant in case one is dropped during assembly.

In the preferred embodiment, the handle and the slips are injection-molded polypropylene of a grade that withstands sterilization by irradiation or ethylene oxide gas.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side view of an apparatus for holding one or more syringes in accordance with the invention.

Figure 2 is a side view of the apparatus of figure 1 with an applicator tip attached to the syringes.

Figure 3 is a side view of an apparatus in accordance with the invention with an alternate clip.

Figure 4a is an end view of a preferred embodiment of a handle in accordance with the invention.

Figure 4b is an end view of an alternate embodiment of a handle in accordance with the invention.

Figure 5a is a side view of a handle showing storage of the clips.

Figure 5b is a perspective of the embodiment of figure 5a.

Figure 6 is a side view of the embodiment shown in figure 4b showing an adaptor for accommodating syringes of different sizes.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to figure 1, a preferred embodiment of the invention includes a handle 2, which is designed with a cradle portion 4 for receiving a first syringe 6. The handle provides a grip for engaging the palm of a user in such a configuration that the thumb of the user is positioned to engage easily the plunger 8 of the syringe 6. A second syringe 10 is held parallel to the first syringe by structure to be described. Each syringe has a luer lock 7 and 9, respectively, for connecting the syringes to conduits, or the like.

With reference to figure 2, an applicator tip 12 is shown connected to the luer lock ends of the first and second syringes 6 and 10. This applicator is one of several known in the art for combining the fluids from the first and second syringes to provide a mixture of the fluids from the two syringes. More than two syringes may be employed with an appropriate applicator tip.

Figure 2 also shows use of a clip 14, which is secured to the ends of the syringe plungers such that a user can operate the syringes simultaneously by pressing on the clip 14. The clip 14 can be stepped to provide attachment parts of different thickness to accommodate syringes of different lengths. Thus, the clip shown in figure 2 provides a first portion 15 that is thicker than a second portion 17 by the difference between the lengths of the two syringes 6 and 10. Figure 3 shows an alternate clip 13 of uniform thickness, to be used when the syringes are of the same length.

Figure 4a is an end view of a handle 2 having a cradle 4 designed to receive a syringe barrel either by insertion from above the cradle in a downward direction or by

longitudinally sliding the syringe barrel into the cradle. In this embodiment, the sides 16 of the cradle project inward and downward slightly and are resilient to receive the barrel of a syringe 6 and hold it securely to the handle. Radial ribs 17 are spaced about the cradle 4 for engaging the syringe and providing secure support by the cradle. In this embodiment, the barrel can be inserted in a direction transverse to the longitudinal axis of the barrel or slid longitudinally into the barrel.

Figure 4b shows an alternate embodiment wherein the cradle is designed to receive the barrel only by sliding it longitudinally into the cradle.

Figure 5a is a side view of the invention showing how spare clips 14 are stored in an open cavity formed by the sides of the handle. In the preferred embodiment, each of the clips has an opening 18 for receiving a post 20 on the handle to hold the clip to the handle such that a user can readily remove the clip from its storage position. The post is preferably cruciform in cross section for resiliently holding the clip.

Figure 5b is a perspective showing two clips stored in the handle. It will be appreciated that each clip includes front and back walls forming two adjacent slots 24, each of which receives a flange on the end of a respective syringe plunger. The front wall is cut out at 26 to accept the plunger's shaft. The slots are preferably directed oppositely, whereby the plungers are inserted from opposite ends of the clip to accommodate the natural tendency of the syringes to come toward each other.

Figure 6 shows how a handle, such as that shown in figure 4b, can be adapted to receive syringes of different sizes. In this embodiment, an adaptor 22 is provided for altering the size of the cradle to receive a syringe having a diameter smaller than the

largest nominal size to be retained by the cradle. A plurality of these adaptors may be provided to accommodate syringes of various sizes.

In use, the syringes may be assembled in almost any order. In one procedure, the applicator tip is secured to the syringes, the syringe 6 is inserted into the cradle 4, and the clip attached. Alternatively, the syringe 6 is inserted into the handle, and the applicator tip, second syringe and clip are then attached. The parts may be assembled in other orders also.

It will be appreciated that a novel for holding and operating one or more syringes has been described. Modifications within the scope of the appended claims will be apparent to those of skill in the art.

I claim:

1. Apparatus for holding and operating one or more syringes comprising a handle and a cradle, wherein said handle is adapted to be held in an operator's hand and said cradle is adapted to removably receive a said syringe.
2. Apparatus according to claim 1 further comprising a clip adapted to engage the ends of the plungers of at least two of said syringes and to connect the plungers for simultaneous movement.
3. Apparatus according to claim 2 wherein said clip accommodates syringes of different lengths.
4. Apparatus according to claim 2 further comprising an applicator tip for connecting to the output end of each syringe and receiving the outputs from said syringes.
5. Apparatus according to claim 2 wherein said handle provides a cavity for storing one or more of said clips.
6. Apparatus according to claim 5 wherein said handle includes at least one post for engaging an opening in a said clip.
7. Apparatus according to claim 2 wherein said clip comprises spaced front and rear walls forming grooves to receive said ends of the plungers.
8. Apparatus according to claim 7 wherein one of said walls is cut out to receive the shaft of a syringe plunger.
9. Apparatus according to claim 1 wherein said cradle is semi-cylindrical and is made of resilient material for receiving a said syringe transverse to the longitudinal axis of said cradle.

10. Apparatus according to claim 1 further comprising an adaptor.
11. Apparatus for holding and operating one or more syringes comprising handle means for providing a grip for an operator's hand and a cradle for receiving the barrel of a single syringe, and further comprising clip means for receiving the plungers of a plurality of syringes and allowing simultaneous operation thereof.
12. Apparatus according to claim 11 wherein said clip accommodates syringes of different lengths.

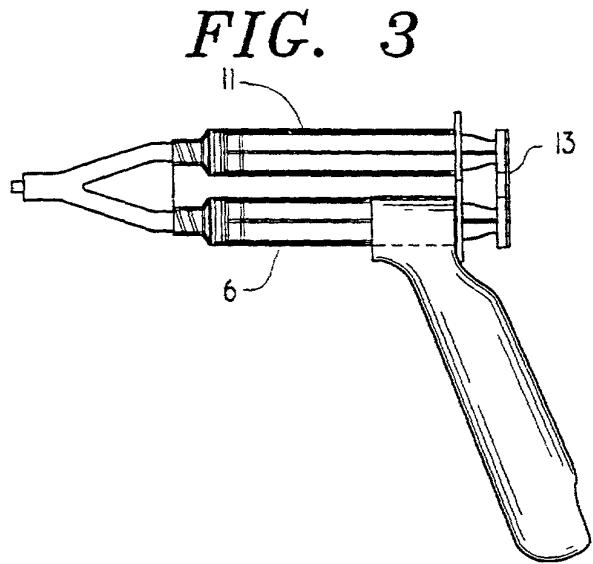
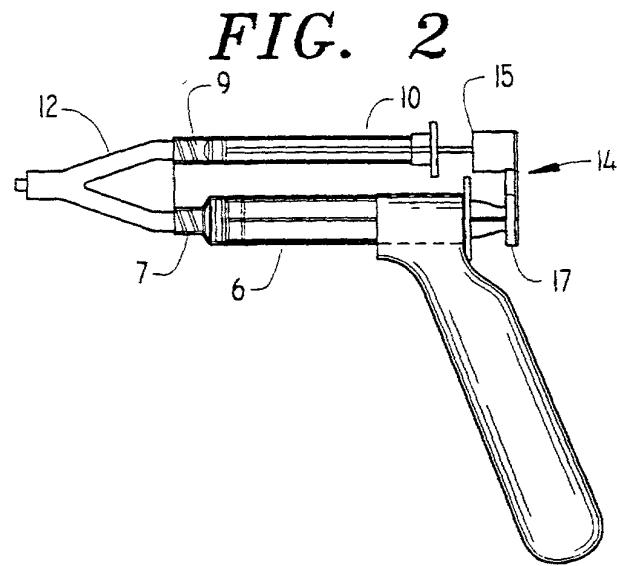
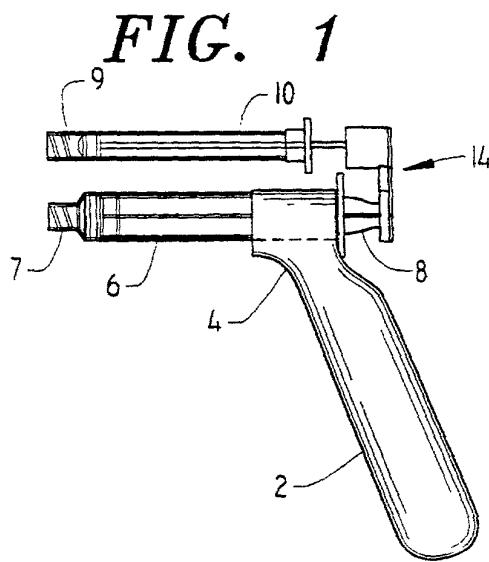
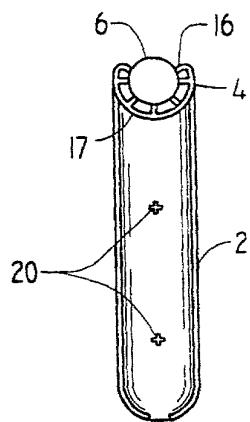
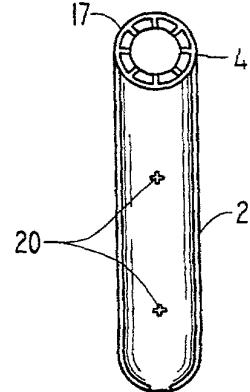
*FIG. 4a**FIG. 4b*

FIG. 5a

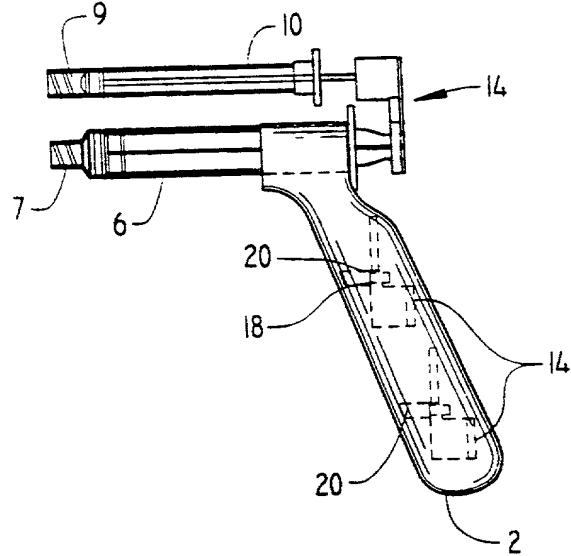


FIG. 5b

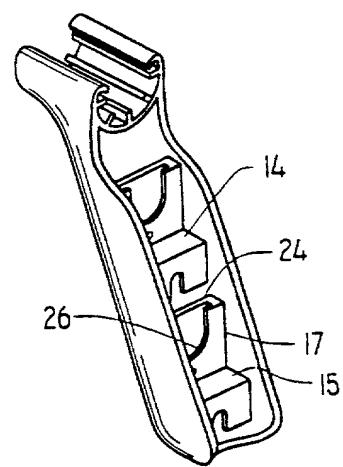
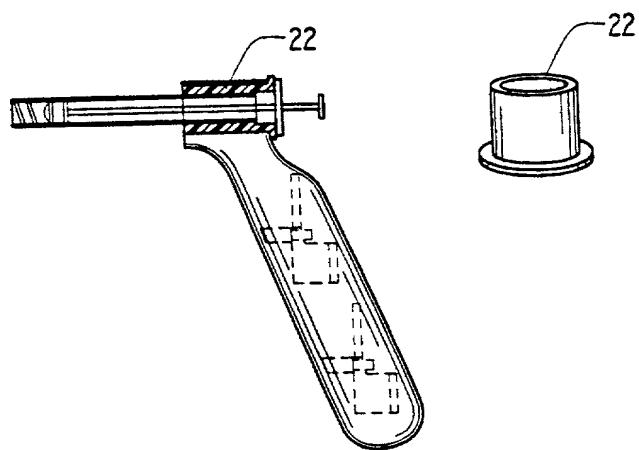


FIG. 6



## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I declare that:

My residence, post office address, and citizenship are as stated below next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter that is claimed and for which a patent is sought on the invention entitled

## APPARATUS FOR HOLDING AND OPERATING ONE OR MORE SYRINGES

the specification of which is attached hereto.  
 was filed on October 6, 2000 as International Patent Application Serial No. PCT/US00/26243.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information of which I am aware and which is material to the examination of the patent application in accordance with 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designates at least one country other than the United States, listed below and have also identified below, by checking the space, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is not claimed.

## Prior Foreign Application(s)

Number	Country	Day/Month/Year Filed	Priority Not Claimed

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

Application Serial Number	Filing Date
<u>60/158,302</u>	<u>08 October 1999 (08.10.99)</u>

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information known to me which is material to the patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application Serial Number	Filing Date	Status (patented, pending, abandoned)
<u>PCT/US00/26243</u>	<u>06 October 2000 (06.10.00)</u>	<u>inactive</u>

Each undersigned applicant hereby appoints CONRAD J. CLARK (Registration No. 30,340) and CHRISTOPHER W. BRODY (Registration No. 33,613), as his attorneys with full power of substitution to prosecute the subject application and to transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence to: CLARK & BRODY, 1750 K Street, NW, Suite 600, Washington, DC 20006; Telephone: 202-835-1111; Facsimile: 202-835-1755.

I hereby declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

100  
Full name of sole or first inventor: Wesley H. Verkaart  
Inventor's signature: Wesley H. Verkaart Date: 5/23/01  
Residence: 15 Hounds Ditch Lane  
Citizenship: US  
Post Office Address: Duxbury, Massachusetts 02332, USA

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Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Residence: \_\_\_\_\_  
Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of third joint inventor, if any: \_\_\_\_\_  
Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Residence: \_\_\_\_\_  
Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

\_\_\_\_\_ Fourth and subsequent joint inventors are listed on second sheet